**REVISED 11/09**

**LSUE COURSE SYLLABUS**

| I. | PHYS 2001 | Instructor: Michael Scanlan |
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| II. | Course description from the current LSUE catalog: |
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General Physics Lec. 3; Cr. 3.
For pre-medical and non-professional science students. Credit will not be given for this course and Physics 2101. The study of mechanics, heat, sound, and light.
Prerequisite: Mathematics 1022.

| III. | Textbook(s) and other required materials: |
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College Physics, 8th ed. by Serway and Vuille, Brooks Cole Publisher.

| IV. | Evaluation/grading (policy and basis; number and frequency of tests and papers; weights of particular tests or papers; etc.): |
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During a semester, three one hour exams (each worth 100 points) and a 2 hour final exam (worth 200 points) will be given. Homework will be completed online via WebAssign. Usual 10 point scale is applied.

Homework will not be accepted late. Make-up exams will not be scheduled. If an exam is anticipated to be missed with an excused absence, the student may take the exam BEFORE it is given to the class, otherwise, the final exam grade will be substituted for the missed exam.

| V. | Policies pertaining to attendance, late work, make-up work, etc.: |
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Attendance for each class period is required in order for the students to understand the materials assigned to them. Late home works, without a valid excuse, will not be accepted. Make-up tests will not be scheduled in cases other than emergency. For an anticipated absence on a regular test time, due to an unavoidable difficulty, consult with your instructor.

| VI. | Course objectives: |
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A. Develop an understanding of the inner workings of the physical systems.
B. Study physics laws and observe how they are connected to the physical systems mentioned in A.
C. Use of "logical deduction" in identifying cause and effects.

D. Study the connection between mathematics and the physical systems with algebra and Trigonometry as the Tools.
E. Relate A, B, C, D to the real life problems. A good portion of the application of physics is in areas of biological sciences.

## VII. Major instructional objectives:

The human body is one of the best examples of a physics laboratory. Eye, where an emulation of the work of lense takes place, sound mechanism enacted as one speaks, conversion of food energy (chemical) into kinetic energy (for regular human activities), heat energy, and fluid mechanics of the blood flow and many more are concerns of the students who participate in these courses. Therefore, a clear and concise connection between the laws of physics and the biological systems around us (i.e. human body, environment etc.) should be the order of this course.

## VIII. Brief summary of course content by major units of instruction:

A. Introduction
    1. Science and Measurement
    2. Fundamental and Derived Units
    3. Dimensional Analysis
B. Motion in One Dimension
    1. Vector and Sealar Quantities
    2. Displacement, velocity, acceleration
    3. Graphical Methods
    4. Constantly accelerated motion
    5. Free Fall
C. Vectors and Two Dimensional Motion
    1. Vector Algebra
    2. Acceleration and Velocity in Two Dimension
    3. Projectile Motion
D. Laws of Motion
    1. $1^{st}$ Law and Force
    2. $3^{rd}$ Law
    3. $2^{nd}$ Law and Applications
    4. Friction Forces
E. Work and Energy
    1. Work and Power
    2. Kinetic Energy, work-Energy Theorem
    3. Gravitational Potential Energy
    4. Conservative and Non-conservative Forces
    5. Conservation of Energy
    6. Potential Energy stored in a Spring
    7. Work done by a variable Force
F. Momentum and collision
    1. Impulse

2. Conservation of Linear Momentum
3. Collision

G. Rotational Motion and the Law of Gravity
1. Angular Measurements
2. Angular Distance, Velocity, and Acceleration
3. Tangential (angular) and linear Quantities
4. Centripetal acceleration and Force
5. Newton's Universal Law of Gravitation

H. Rotational Equilibrium and Dynamics
1. Equilibrium of a Point Object
2. Torques
3. 2nd Condition for Rtational Equilibrium
4. Center of Gravity
5. Torque and Angular Acceleration
6. Moment of Inertia
7. Rotational Kinetic Energy and angular momentum

I. Vibratory Motion
1. Simple Harmonic Motion and Hooke's Law
2. Frequency of Vibration, Uniform Circular Motion
3. Simple Pendulum, wave motion
4. Waves on a String
5. Reflection of a Wave, characteristics of a wave
6. Resonance, superposition, and interference of waves

J. Sound
1. Characteristics of Sound waves
2. Speed of Sound
3. Intensity of Sound
4. Spherical and plane waves
5. Standing waves, Resonance
6. Resonance of Air Columns
7. Doppler Effect

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K. Mechanical Properties of Matter (Solids and Fluids)
1. States of Matter, Deformation of Solids
2. Density and pressure
3. The concept of Modulus
4. Pressure in a Fluid, Pascal's law
5. Archimede's Principle
6. Viscosity
7. Bernoulli's Equation, Fluids in motion

L. Thermal physics
1. Temperature, Thermometer, and Scales
2. Thermal expansion
3. Ideal Gas Law
4. Kinetic Theory of Gases

M. Heat

1. The Mechanical Equivalent of Heat
2. Specific Heat Capacity
3. Latent Heat, Phase change
4. Calorimetry
5. Transfer of Heat

N. The Laws of Thermodynamics
1. State Variables, work and heat
2. 1st Law
3. Typical Processes in Gases
4. Efficiency of an Engine
5. 2nd Law, Reversible and Irreversible processes
6. Entropy and Disorder
7.
8. Standing Waves
9. Longitudinal Waves

## IX. Methods of instruction:

The scheduled lectures accompanied with the use of demonstration will constitute the core of the instructional method.

## ADS Americans with Disabilities Act) Statement

Any student who is a "qualified individual with a disability" as defined by Section 504 of the Rehabilitation Act and Title II of the ADA, and who will need accommodated services (e.g., note takers, extended test time, audiotape, tutorials, etc.) for this course must register and request services through the Office of Academic Assistance Programs, S-150.

## CSD CODE OF STUDENT CONDUCT

LSUE enforces discipline on campus to protect the academic environment of the campus and the health and safety of all members of the University community. To accomplish this objective, the University enforces standards of conduct for its students. Students who violate these standards can be denied membership in the LSUE community through imposition of disciplinary sanctions.

The LSUE Code of Student Conduct can be found on the LSUE website (lsue.edu). Follow the "Current Students" link from the homepage, and then click on "Student Handbook."